FORM PTO-1390 (REV. 5-93)

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER
12308/1

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)
10/031322

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED:
PCT/CH00/00373	06 July 2000 (06.07.00)	09 July 1999 (09.07.99)

TITLE OF INVENTION
DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES

APPLICANT(S) FOR DO/EO/US
Dieter ARABIN

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) immediately rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)) (unsigned).
10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☒ A substitute specification and Marked-Up Copy
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: International Search Report (translated), Preliminary Examination Report

EXPRESS MAIL NO.: EL243101568US

APPLICATION NO (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
10/031322	PCT/CH00/00373	12308/1

17. ☒ The following fees are submitted:

	CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EUROPEAN PATENT OFFICE or JPO	$890.00	
International preliminary examination fee paid to USPTO (37 CFR 1.482)	$710.00	
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))	$740.00	
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO	$1,040.00	
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)	$100.00	
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 890	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).		

Claims	Number Filed	Number Extra	Rate		
Total Claims	3 - 20 =	0	X $18.00	$ 0	
Independent Claims	1 - 3 =	0	X $84.00	$ 0	
Multiple dependent claim(s) (if applicable)			+ $280.00	$ 0	
TOTAL OF ABOVE CALCULATIONS =				$ 890	
Reduction by ½ for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				$	
SUBTOTAL =				$ 890	
Processing fee of $130.00 for furnishing the English translation later the ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).			+	$	
TOTAL NATIONAL FEE =				$ 890	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property			+	$	
TOTAL FEES ENCLOSED =				$ 890	
				Amount to be: refunded	$
				charged	$

☐ A check in the amount of $_____ to cover the above fees is enclosed.

☒ Please charge my Deposit Account No. 11-0600 in the amount of **$890.00** to cover the above fees. A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 11-0600. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:
Kenyon & Kenyon
One Broadway
New York, New York 10004

Customer No. 26646

SIGNATURE

David I. Greenbaum, Reg. No. 46,739
NAME

1/9/02
DATE

[12308/1]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s)	:	Dieter ARABIN
Serial No.	:	To Be Assigned
Filed	:	Herewith
For	:	DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES
Art Unit	:	To Be Assigned
Examiner	:	To Be Assigned

Assistant Commissioner
for Patents
Washington, D.C. 20231
Box Patent Application

PRELIMINARY AMENDMENT AND
37 C.F.R. § 1.125 SUBSTITUTE SPECIFICATION STATEMENT

SIR:

Please amend the above-identified application before examination, as set forth below.

IN THE SPECIFICATION AND ABSTRACT:

In accordance with 37 C.F.R. § 1.121(b)(3), a Substitute Specification (including the Abstract, but without claims) accompanies this response. It is respectfully requested that the Substitute Specification (including Abstract) be entered to replace the Specification of record.

IN THE CLAIMS:

Without prejudice, please cancel original claims 1 to 3 and substitute/annexed claims 1 to 3, and please add new claims 4 to 6 as follows:

4. (New) A drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor, the drive bearing comprising:

an element located at an interface between the tool and the drive shaft on a tool axis,

the element having an axially projecting coupling cone that engages a counter recess of the drive shaft, the cone is releasably held in the recess by frictional engagement,

wherein an angular position of the element is adjustable, and wherein the element is centered and configured to be secured to prevent rotation.

5. (New) The drive bearing according to claim 4 further comprising:

an undercut on an inner bore of the coupling cone of the element; and

a tensioning rod having a spreading head, the rod configured to extend through the drive shaft of the servomotor so that the cone frictionally engages the counter recess in the drive shaft in that for a releasable holding of the coupling cone latter is provided with.

6. (New) The drive bearing according to claim 5, wherein the drive shaft further comprises channels for delivering a pressurized medium to detach the cone, released from the tightening rod, from the counter recess in the drive shaft.

Remarks

This Preliminary Amendment cancels without prejudice original claims 1 to 3 and substitute/annexed claims 1 to 3 in the underlying PCT Application No. PCT/CH00/00373, and adds without prejudice new claims 4 to 6. The new claims conform the claims to U.S. Patent and Trademark Office rules and do not add new matter to the application.

In accordance with 37 C.F.R. § 1.121(b)(3), the Substitute Specification (including the Abstract, but without the claims) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to U.S. Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. § 1.121(b)(3)(iii) and § 1.125(b)(2), a Marked Up Version Of The Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. Approval and entry of the Substitute Specification (including Abstract) are respectfully requested.

The underlying PCT Application No. PCT/CH00/00373 includes an International Search Report, dated October 13, 2000, and an International Preliminary Examination Report, dated October 16, 2001, copies of which are submitted herewith.

Applicant asserts that the subject matter of the present application is new, non-obvious, and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully Submitted,

KENYON & KENYON

Dated: January 9, 2002

By: _____

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DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES

Background of the Invention

The present invention relates to a drive bearing arrangement of rotating tools in printing machines, particularly label printing machines. Specifically, the arrangement of rotating tools at the drive shafts of such machines, for example, the drive shaft of a servomotor.

It has been found to be advantageous in printing machines---particularly label printing machines---to allocate separate drives by means of a servo motor to the separate units of a printing machine such as the printing cylinder, embossing cylinder, or punching cylinder. This replaces the central drive and gear wheels (or chains or toothed belts).

Such a set-up is beneficial in that the individual components of each printing unit can be exchanged relatively quickly and easily. This allows the machine to be used in a more optimal fashion.

With regard to label printing machines, the highest demands are made on the precise position of each tool. Moreover, the simple and fast exchanging potential poses high demands on the interface of the change functions, namely the drive bearing arrangement between one end of the tools and the drive shaft of the stationary mounted servomotor.

Summary of the Invention

The object of the present invention is to provide a drive bearing arrangement between a rotating tool and a drive shaft which, in consideration of a tool changes,

can be disconnected relatively quickly and improve the precision of the bearing in comparison with conventional solutions.

This object is solved by providing a drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor. The drive bearing includes an element located at an interface between the tool and the drive shaft on a tool axis. The element has an axially projecting coupling cone that engages a counter recess of the drive shaft. The cone is releasably held in the recess by frictional engagement. The angular position of the element is adjustable, and the element is centered and configured to be secured to prevent rotation.

Due to the design of the drive bearing arrangement in accordance with the present invention, a geometrically optimal coupling between the tool and the drive for the rotating printing tools are provided that can be disconnected quickly and easily.

The invention will be explained below with reference to the embodiments illustrated in the drawing somewhat more in detail.

Brief Description of the Drawings

Fig. 1 schematically illustrates a printing machine with a plurality of printing units and additional parts;

Fig. 2 illustrates a drive bearing of the printing machine shown in Fig. 1 in accordance with the invention; and

Fig. 3 an embodiment of a coupling cone of the

printing machine shown in Fig. 1.

Detailed Description of the Invention

Fig. 1 illustrates a modern printing machine of which the parts and printing units are electronically controlled through respective servomotors. The printing machine includes a web reeling off unit 1, a conditioning unit 2, which may include a screen printing device 3, a printing device 4, a plurality of further printing units 5 - 9, a flex printing device 10 with a drying device 11, a supply part 12, a processing part 13 with punching device 14, reeling unit 15 and cutting unit 16, as well as a reeling unlit 7 as storage part. The individual units are activated depending on the task at hand.

The rotating tools can be quickly exchanged in order to be available for new tasks.

Fig. 2 illustrates how a rotating tool 18 is releasably but firmly coupled via an element 19 having an axial projecting connecting cone 20 to the drive shaft 21 of a servomotor 22 (illustrated schematically). The other end of the tool 18 is held in a known manner in a bearing, e.g., a needle bearing located in a detachable flange of a frame (not shown). Motor 22 is also mounted to a flange 23 of the base frame of the unit.

The servomotor 22 serves as drive for one of a variety of cylinders or other devices in the printing machine. For example, servomotor 22 can drive a form cylinder, a counter pressure cylinder, a coloring apparatus, or any additional similar device.

The tools (form cylinder, counter pressure cylinder,

coloring apparatus) first extend or pivot away from the frame flanges (not illustrated). Each tool is provided with connecting cone 20 and is inserted into cone shaped recesses 24 of drive shafts 21 and precisely centered therein. In order to have the tool sitting with the correct angular position on drive shaft 21, a pin 25 is employed to anchor the coupling cone 20. The pin 25 also safeguards against unwanted rotation with respect to recess 24. The coupling occurs by frictional engagement between the surfaces of cone 20 and cone shaped recess 24 in that coupling cone 20 is tightened by means of a tightening rod 26 (26') against the drive shaft 21 (for example, by a tightening through a threaded drive).

Tightening rod 26 (26') (see Fig. 2) engages thereto a central undercut bore 27 of the cone 20 where a spreading head is located which can be extended to such an extent that the cone 20 is tightened and a optimal drive connection is provided. In order to release the drive connection or the drive bearing, it is only necessary to release the tightening rod 26 (with spreading head 28).

In order to quickly release the cone coupling, a pressurized medium such as air is passed through channels 29.

Fig. 3 of the drawing illustrates a variant of element 19' with coupling cone 20' and undercut, central bore 27'. This element 19' is suitable for an axial screwing onto a tool by means of several screws (Screw holes 30).

Abstract

A drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor. The drive bearing including an element located at an interface between the tool and the drive shaft on a tool axis. The element has an axially projecting coupling cone that engages a counter recess of the drive shaft. The cone is releasably held in the recess by frictional engagement. The angular position of the element is adjustable, and the element is centered and configured to be secured to prevent rotation.

[DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES

Background of the Invention] **Drive bearing arrangement of rotating tools in printing machines**

The present invention relates to a drive bearing arrangement of rotating tools in printing machines, [particularly] specifically label printing machines[. Specifically, the arrangement of rotating tools at the drive shafts of such machines, for example], at the drive shaft, e.g., the drive shaft of a servomotor.

[It has been found to be advantageous] The present development in printing machines[---particularly], specifically label printing machines[---to allocate separate drives by means of a servo motor to the separate units of], goes to no longer to drive the rotating tools of the various printing units through a [printing machine such as the printing cylinder, embossing cylinder, or punching cylinder. This replaces the] central drive and gear wheels[(or chains or toothed belts).], chains or toothed belts, but to rather allocate to each separate tool such as e.g. printing cylinder, counter pressure cylinder, embossing and punching cylinder a own drive by means of a servo motor.

[Such a set-up is beneficial in that] This leads to a printing machine of which the individual components of each printing unit can be exchanged [relatively quickly and easily. This allows the machine to be used in a more optimal fashion.] very fast and in a simple way. Due to this a printing machine can be applied optimally.

[With regard to] Specifically at label printing machines,

[the] however, highest demands are made on the precise position of each tool[. Moreover,], which especially due to the simple and fast exchanging [potential] possibilities poses [high] highest demands on the interface of the change functions, namely the drive bearing arrangement between the one end of the tools and the drive shaft of the stationary mounted servomotor.

[Summary of the Invention
The object] Object of the present invention [is] has been to provide a drive bearing arrangement between a rotating tool and a drive shaft, which[,] in consideration of a [tool changes,] changing of tools can be disconnected [relatively quickly and improve] very fast and possibly improves the precision of the bearing in comparison with conventional solutions still more.

This object is solved [by providing a drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor. The drive bearing includes an element located at an interface between the tool and the drive shaft on a tool axis. The element has an axially projecting coupling cone that engages a counter recess of the drive shaft. The cone is releasably held in the recess by frictional engagement. The angular position of the element is adjustable, and the element is centered and configured to be secured to prevent rotation.] at a drive bearing arrangement if the kind defined above in accordance with the invention by the features of the characterising portion of claim 1. Specific embodiments of the subject of the invention are defined in the independent claims.

Due to the design of the drive bearing arrangement in accordance with the present invention[,] a geometrically

optimal coupling between the tool and the drive for the rotating printing tools are provided [that] which can be disconnected [quickly] fast and easily, which allows a fast exchanging of tools.

The invention will be explained below with reference to the embodiments illustrated in the drawing somewhat more in detail. There is illustrated in: [Brief Description of the Drawings]

[Fig. 1]Fig. 1 purely schematically [illustrates] a printing machine with a plurality of printing units and additional parts;

Fig. 2 [illustrates] a drive bearing [of the printing machine shown in Fig. 1] in accordance with the invention[; and], and

[Fig. 3 an embodiment of a coupling cone of the printing machine shown in Fig. 1.] Fig. 3 a variant of the coupling cone.

[Detailed Description of the Invention]In the figure Fig. 1 illustrates a modern printing machine of which the parts and printing units are driven electronically controlled through respective own servomotors. The printing machine includes a web reeling off unit 1, a conditioning unit 2, [which may include] e.g. a screen printing device 3, a printing device 4, a plurality of further printing units 5 - 9, a flex printing device 10 with a drying device 11, a supply part 12, a processing part 13 with punching device 14, reeling unit 15 and cutting unit 16, as well as a reeling unlit 7 as storage part[.], . The individual units [are activated] get enlisted depending [on the task at hand] from the order

to be carried out.

The rotating tools can be [quickly] exchanged fast in order to be available for new [tasks] duties.

Fig. 2 illustrates how a rotating tool 18 is [releasably but]releasable but absolutely firmly connected or coupled, respectively, via an element 19 mounted thereto having [an] a axial projecting connecting cone 20 to the drive shaft 21 of a servomotor 22 (illustrated schematically)[. The] (the other end of the tool 18 is held in a as such known manner in a bearing, e.g.[,] a needle bearing which is located in a easily detachable not illustrated flange of a frame[(not shown). Motor 22]). The motor is also mounted to a flange 23 of the base frame of the unit.

The servomotor 22 serves e.g. as drive for [one of a variety of cylinders or other devices in the printing machine. For example, servomotor 22 can drive] a form cylinder, a counter pressure cylinder[, a coloring apparatus, or any additional similar device.

The] or as drive for a colouring apparatus.

After a extending or pivoting away, respectively, of the (not illustrated) frame flanges the tools (form cylinder, counter pressure cylinder, [coloring apparatus) first extend or pivot away from the frame flanges (not illustrated). Each tool is provided with connecting] colouring apparatus) each of which being provided with coupling cone [20 and] is inserted into the cone shaped recesses 24 of the drive shafts 21 and precisely [centered] centred therein. In order to have the tool sitting with the correct angular position on the drive

shaft 21[,] a pin 25 is [employed to anchor] foreseen which holds the coupling cone 20[. The pin 25 also safeguards against unwanted rotation with respect to recess 24. The coupling occurs by] in the correct position (ads possibly also to safeguard against rotating). The coupling proper proceeds by a frictional engagement between the surfaces of the cone 20 and the cone shaped recess 24 in that the coupling cone 20 is tightened by means of a tightening rod 26 (26') against the drive shaft 21 [(for example,] (by a tightening at the right hand side end, e.g., through a threaded drive).

[Tightening] The tightening rod [26 (26')] (see Fig. 2) engages thereto a central undercut bore 27 of the cone 20 where a spreading head is located which can be extended to such an extent that the cone 20 is tightened and a optimal drive connection is provided. In order to release the drive connection or the drive bearing[,] it is [only] merely necessary to release the tightening rod 26 (with spreading head 28).

[In order to quickly release] For a simple, fast releasing of the cone coupling[,] it is possible to use a pressurized medium [such as air is passed through] (e.g., pressurized air) via channels 29.

Fig. 3 of the drawing illustrates a variant of e element 19' with coupling cone 20' and undercut, central bore 27'.

This element 19' is suitable for an axial screwing onto a tool by means of several screws (Screw holes 30).

[

Abstract

A drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor. The drive bearing including an element located at an interface between the tool and the drive shaft on a tool axis. The element has an axially projecting coupling cone that engages a counter recess of the drive shaft. The cone is releasably held in the recess by frictional engagement. The angular position of the element is adjustable, and the element is centered and configured to be secured to prevent rotation.]

2/PRTS

Drive bearing arrangement of rotating tools in printing machines

The present invention relates to a drive bearing arrangement of rotating tools in printing machines, specifically label printing machines, at the drive shaft, e.g., the drive shaft of a servomotor.

The present development in printing machines, specifically label printing machines, goes to no longer to drive the rotating tools of the various printing units through a central drive and gear wheels, chains or toothed belts, but to rather allocate to each separate tool such as e.g. printing cylinder, counter pressure cylinder, embossing and punching cylinder a own drive by means of a servo motor.

This leads to a printing machine of which the individual components of each printing unit can be exchanged very fast and in a simple way. Due to this a printing machine can be applied optimally.

Specifically at label printing machines, however, highest demands are made on the precise position of each tool, which especially due to the simple and fast exchanging possibilities poses highest demands on the interface of the change functions, namely the drive bearing arrangement between the one end of the tools and the drive shaft of the stationary mounted servomotor.

Object of the present invention has been to provide a drive bearing arrangement between a rotating tool and a drive shaft, which in consideration of a changing of tools can be disconnected very fast and possibly improves the precision of the bearing in comparison with

conventional solutions still more.

This object is solved at a drive bearing arrangement if the kind defined above in accordance with the invention by the features of the characterising portion of claim 1. Specific embodiments of the subject of the invention are defined in the independent claims.

Due to the design of the drive bearing arrangement in accordance with the present invention a geometrically optimal coupling between the tool and the drive for the rotating printing tools are provided which can be disconnected fast and easily, which allows a fast exchanging of tools.

The invention will be explained below with reference to the embodiments illustrated in the drawing somewhat more in detail. There is illustrated in:

Fig. 1 purely schematically a printing machine with a plurality of printing units and additional parts;

Fig. 2 a drive bearing in accordance with the invention, and

Fig. 3 a variant of the coupling cone.

In the figure Fig. 1 illustrates a modern printing machine of which the parts and printing units are driven electronically controlled through respective own servomotors. The printing machine includes a web reeling off unit 1, a conditioning unit 2, e.g. a screen printing device 3, a printing device 4, a plurality of further

printing units 5 - 9, a flex printing device 10 with a drying device 11, a supply part 12, a processing part 13 with punching device 14, reeling unit 15 and cutting unit 16, as well as a reeling unlit 7 as storage part, The individual units get enlisted depending from the order to be carried out.

The rotating tools can be exchanged fast in order to be available for new duties.

Fig. 2 illustrates how a rotating tool 18 is releasable but absolutely firmly connected or coupled, respectively, via an element 19 mounted thereto having a axial projecting connecting cone 20 to the drive shaft 21 of a servomotor 22 (illustrated schematically) (the other end of the tool 18 is held in a as such known manner in a bearing, e.g. a needle bearing which is located in a easily detachable not illustrated flange of a frame). The motor is also mounted to a flange 23 of the base frame of the unit.

The servomotor 22 serves e.g. as drive for a form cylinder, a counter pressure cylinder or as drive for a colouring apparatus.

After a extending or pivoting away, respectively, of the (not illustrated) frame flanges the tools (form cylinder, counter pressure cylinder, colouring apparatus) each of which being provided with coupling cone is inserted into the cone shaped recesses 24 of the drive shafts 21 and precisely centred therein. In order to have the tool sitting with the correct angular position on the drive shaft 21 a pin 25 is foreseen which holds the coupling cone 20 in the correct position (ads possibly also to

safeguard against rotating). The coupling proper proceeds by a frictional engagement between the surfaces of the cone 20 and the cone shaped recess 24 in that the coupling cone 20 is tightened by means of a tightening rod 26 (26') against the drive shaft 21 (by a tightening at the right hand side end, e.g., through a threaded drive).

The tightening rod (see Fig. 2) engages thereto a central undercut bore 27 of the cone 20 where a spreading head is located which can be extended to such an extent that the cone 20 is tightened and a optimal drive connection is provided. In order to release the drive connection or the drive bearing it is merely necessary to release the tightening rod 26 (with spreading head 28).

For a simple, fast releasing of the cone coupling it is possible to use a pressurized medium (e.g., pressurized air) via channels 29.

Fig. 3 of the drawing illustrates a variant of e element 19' with coupling cone 20' and undercut, central bore 27'.

This element 19' is suitable for an axial screwing onto a tool by means of several screws (Screw holes 30).

Patent Claims

1. Drive bearing of rotating tools in printing machines, specifically label printing machines at the drive shaft, characterised in that at the interface between tool and drive shaft a element in the tool axis is arranged on same, which element is provided with a axially projecting coupling cone which engages in turn in a corresponding recess of the drive shaft and is held therein releasable at a predetermined angular position centred and is secured against a rotation.

2. Drive bearing according to claim 1, characterised in that for a releasable holding of the coupling cone latter is provided with a undercut inner bore into which a tensioning rod with a spreading head extending through the drive shaft of the motor engages in order to place the cone against the corresponding wall of the counter recess in the drive shaft.

3. Drive bearing according to claim 2, characterised in that means are foreseen in order to detach the cone released from the tightening rod from the seat in the drive shaft by means of a pressurised medium, e.g. pressurised air.

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

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PCT

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99113288.7 9. Juli 1999 (09.07.1999) EP

(71) Anmelder *(für alle Bestimmungsstaaten mit Ausnahme von US)*: GALLUS FERD. RÜESCH AG [CH/CH]; Harzbuchelstrasse 34, CH-9016 St. Gallen (CH).

(72) Erfinder; und
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(81) Bestimmungsstaaten *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

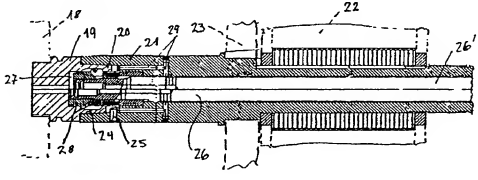
(84) Bestimmungsstaaten *(regional)*: ARIPO-Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI-Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Veröffentlicht:
— *Mit internationalem Recherchenbericht.*

Zur Erklärung der Zweibuchstaben-Codes, und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(54) Title: DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES

(54) Bezeichnung: ANTRIEBSLAGERUNG VON ROTIERENDEN WERKZEUGEN IN DRUCKMASCHINEN



(57) Abstract: The inventive drive bearing arrangement of printing tools (18) on drive shafts (21), e.g. drive shafts of servomotors (22), is based on the use of connecting cones (20) that are mounted on said tools. Said connecting cones provides a drive connection that can be released simply and quickly and is resistant to torsion, and ensure that very high standards of precision (shaft alignment, lateral clearance) are met.

(57) Zusammenfassung: Die Antriebslagerung von Druckwerkzeugen (18) auf Antriebswellen (21), z.B. Antriebswellen von Servomotoren (22), basiert auf der Verwendung von an den Werkzeugen angebrachten Verbindungskonussen (20), welche eine leicht und schnell lösbare, verdrehsichere Antriebsverbindung gewährleisten, welche die Einhaltung höchster Präzision garantieren (Wellenausrichtung, Seitenabstand).

WO 01/03929 A1

Fig. 1

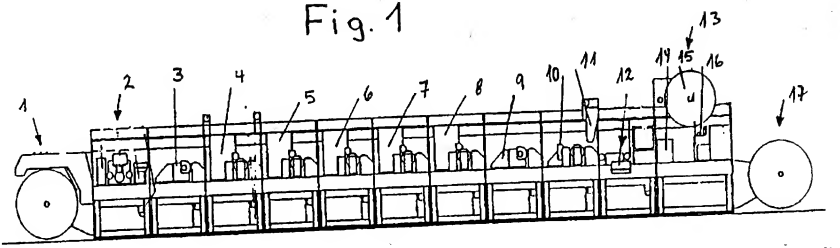


Fig. 2

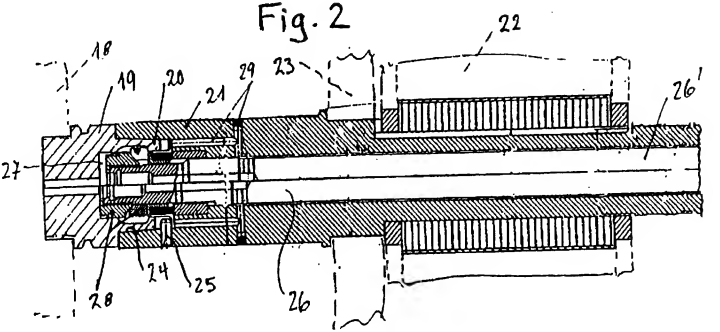
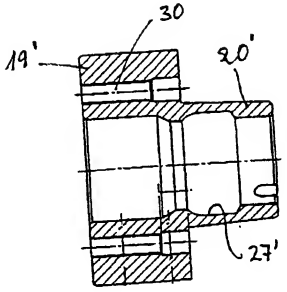


Fig. 3



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COMBINED DECLARATION AND
POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below adjacent to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES**, the specification of which was filed as International Application No. PCT/CH00/00373 on the 6th day of July, 2000.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international applications(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S)
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119

Country : Europe

Application No. : 99 113 288.7

Date of Filing: July 9, 1999

Priority Claimed
Under 35 U.S.C. § 119 : [X] Yes [ ] No

I hereby claim the benefit under Title 35, United States Code § 120 of any United States Application or PCT International Application designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations § 1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR
PCT INTERNATIONAL APPLICATIONS
DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. § 120

U.S. APPLICATIONS

Number :

Filing Date :

PCT APPLICATIONS
DESIGNATING THE U.S.

PCT Number :

PCT Filing Date :

I hereby appoint the following attorney(s) and/or agents to prosecute the above-identified application and transact all business in the Patent and Trademark Office connected therewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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Inventor's signature _____ Date 12.06.2007

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